

REMARKS

By this Amendment, claim 12 is canceled without prejudice to or disclaimer of the subject matter therein. Accordingly, claims 2, 9-11, 13 and 14 are pending in this application.

I. Rejection Under 35 U.S.C §103(a)

The Office Action rejects claims 2 and 9-14 under 35 U.S.C. §103(a) over U.S. Patent No. 5,764,315 to Yokota et al. ("Yokota") in view of U.S. Patent No. 6,048,071 to Sawayama. The rejection is moot with respect to canceled claim 12 and is respectfully traversed with respect to the remaining claims.

Neither Yokota nor Sawayama teaches or suggests a spread illuminating apparatus including "a bar-like light source is provided at and parallel with a side surface of a transparent substrate, wherein a plurality of straight groove portions are formed directly on a major surface of said transparent substrate intersecting one another, whereby light traveling in a direction substantially parallel to a major surface of the transparent substrate is reflected at said plurality of straight groove portions in a direction substantially perpendicular to the major surface of the transparent substrate so as to travel toward the liquid crystal panel," as recited in independent claim 2.

The Office Action asserts that Yokota discloses a spread illuminating apparatus including a square transparent substrate 60 provided close to a surface of a liquid crystal panel, citing Figs. 14 and 28, and the Abstract. The Office Action also asserts that Yokota discloses a plurality of straight grooves portions 61a, 61b that are formed on a surface the transparent substrate 60 and that intersect one another obliquely with respect to the four sides of the transparent substrate so as to reflect light towards the liquid crystal panel or planar lighting device, citing col. 5, lines 24-29.

The Office Action admits that Yokota does not disclose light traveling in a direction substantially parallel to a major surface of the transparent substrate 60 is reflected at the

plurality of straight groove portions 61a, 61b in a direction substantially perpendicular to a major surface of the transparent substrate 60 so as to travel toward the liquid crystal panel. However, the Office Action asserts that Sawayama remedies the deficiencies of Yokota.

Specifically, the Office Action alleges that Sawayama discloses that a front light 20 travels and passes through a groove in a direction substantially parallel to a major surface of a transparent substrate 2, and the front light 20 is reflected at the groove portions in a direction substantially perpendicular to the major surface of the transparent substrate so as to travel toward a liquid crystal display element 10, citing Figs. 1 and 2(b), Abstract and col. 12, lines 12-28. Therefore, the Office Action alleges that it would have been obvious to one of ordinary skill in the art to implement the light travel taught by Sawayama into the Yokota apparatus so as to incline the incident light with respect to a normal direction of the light exit surface. Applicant respectfully disagrees.

Sawayama teaches a reflection-type LCD including a front-light 20 provided on a front surface of a reflection-type liquid crystal cell 10. See Figs. 1 and 2(a), col. 10, lines 33-38, and col. 12, lines 5-11. The front-light 20 includes a light source 26 with a grooved prism sheet 81 and includes a light-conducting body 24 including parallel interfaces 23, 28 and a light-entry surface 25. See Figs. 1 and 2(a), and col. 12, lines 12-20. In the corresponding Figs. 1 and 2(a), the light-entry surface 25 is inclined with respect to the parallel interfaces 23, 28, so that light traveling perpendicular to the light-entry surface 25 strikes the interface 23 with an angle of incidence θ_2 and may be reflected toward the interface 28 to travel to the reflection-type liquid crystal cell. See col. 14, lines 35-38. As a result of the inclined light-entry surface 25, there is little loss of light traveling perpendicular to the light-entry surface 25 and efficiency of use of light from the light source 26 may be increased. See col. 14, lines 39-42.

Although the Office Action appears to assert that Fig. 2(b) of Sawayama also corresponds to the embodiment shown in Fig. 1, Applicant respectfully disagrees. Sawayama teaches that Fig. 2(b) is an explanatory diagram, used for the purpose of comparison with the embodiment of the invention show in Figs. 1 and 2(a), showing the behavior of light in a light-conducting body 184 including a light-entry surface 185 that is perpendicular to parallel interfaces 183, 188. See col. 10, lines 39-42, and col. 14, lines 1-27. In the Fig. 2(b) structure, light is projected from a light source through the light-entry surface 185, travels perpendicular to the light-entry surface 185, and escapes through a surface 186 opposite the light-entry surface 185. See col. 14, lines 28-32. As a result of the perpendicular light-entry surface 185, there is a great loss of light from the light source. See col. 14, lines 32-34. Therefore, Sawayama teaches away from the structure of the light-conducting body 184.

Because Sawayama teaches away from using a light-conducting body in which all opposing sides are parallel, no motivation exists in either Yokota or Sawayama to implement the light travel taught by Sawayama into the Yokota apparatus so as to incline the incident light with respect to a normal direction of the light exit surface as alleged by the Office Action.

Sawayama also does not teach or suggest that light traveling from the grooved prism sheet 81 is substantially parallel to the interfaces 183, 188 of the light-conducting body 184. Although Sawayama teaches that light from the grooved prism sheet 81 travels perpendicular to the light-entry surface 185, the entering light travels toward the opposing surface 186, not the reflection-type liquid crystal cell 10. Therefore, Sawayama does not teach or suggest the light traveling in a direction substantially parallel to the interfaces 183, 188 of the light-conducting body 184 is reflected in a direction substantially perpendicular to the interfaces 183, 184 so as to travel toward the reflection-type liquid crystal cell 10.

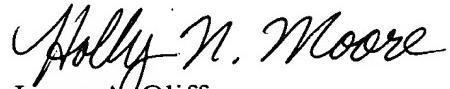
Because Sawayama does not teach or suggest light traveling in a direction substantially parallel to interfaces of a light-conducting body, Sawayama cannot be reasonably considered to teach or suggest that parallel traveling light is reflected in a direction substantially perpendicular to the interfaces so as to travel toward a reflection-type liquid crystal cell. Therefore, Sawayama does not remedy the deficiencies of Yokota. For at least the reasons discussed above, any permissible combination of Yokota and Sawayama does not teach or suggest the spread illuminating apparatus of claim 2. Therefore, claim 2 would not have been rendered obvious by Yokota and Sawayama. Claims 9-14 depend from claim 2, and thus also would not have been rendered obvious by Yokota and Sawayama for at least the reasons set forth above, as well as for the additional features they recite. Reconsideration and withdrawal of the rejection is respectfully requested.

II. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 2, 9-111, 13 and 14 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



James A. Oliff
Registration No. 27,075

Holly N. Moore
Registration No. 50,212

JAO:HNM/cfr

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OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

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